Shinobu AKIYAMA*: ***Impatiens bicornuta* Wall. and its allied species in Nepal**

秋山 忍*: *Impatiens bicornuta* Wall. とその近縁種

Hooker (1875) classified *Impatiens bicornuta* Wall. in the section Subumbellatae, which is characterized by the elongate, linear or clavate, rarely shortly clavate capsule, the oblong or obovoid, compressed seeds, the usually rugulose, opaque, coriaceous, glabrous testa, the interrupted racemes and the often large purplish flower, together with *I. amphorata*, *I. Edgeworthii*, *I. mishmiensis* and *I. radiata*. *I. bicornuta* Wall. is quite different from other species in this section and characterized by rather large flowers attaining 19-25 mm long from the tip of the lower sepal (lip) to that of the dorsal petal (standard), the caudate lateral united petals (wing) and the lower sepal horned at the tip and produced downwards into a broad conoid or oblong incurved sac (Hooker 1875). Later, Hooker (1905) redefined *I. bicornuta* with the caudate distal lobes of the lateral united petals, the minute orbicular long-awned lateral sepal and the sigmoidly incurved lower sepal, but did not report any other such species from eastern Himalaya.

The late Professor Hara (1965) described a new species, *I. Pradhani*, based on his own collection in Sikkim. *I. Pradhani* is very close to *I. bicornuta*, but differs from that in having broadly winged stems and longer projecting appendage at the mouth of lower sepal.

Though *I. Pradhani* was reported only from Sikkim, in 1983 I noticed an *Impatiens* resembling *I. Pradhani* in several localities in central and eastern Nepal. These Nepalese plants have wingless stems, but, other vegetative features agree with those of the type of *I. Pradhani*. That is, the leaves are alternate, 12-25 cm long with the petiole, crowded towards the top of the stem (up to 1 m tall) and have elliptic lamina of 10-22 cm long and 4-6 cm wide with acute apex, attenuate base and crenate margin. The type of the inflorescence also agrees with that of *I. Pradhani*, i.e., axillary interrupted raceme consisting of 10-20-

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flowers. The variation of the flowers was studied in a single population of the Nepalese *Impatiens* consisting of several individuals (Fig. 1C–E) along with the flowers taken from another population (Fig. 1B) and from the type specimen of *I. Pradhani* (Fig. 1A).

The projecting appendage at the mouth of lower sepal, characterizing *I. Pradhani*, is conspicuous in the type specimen, but it showed some variation in

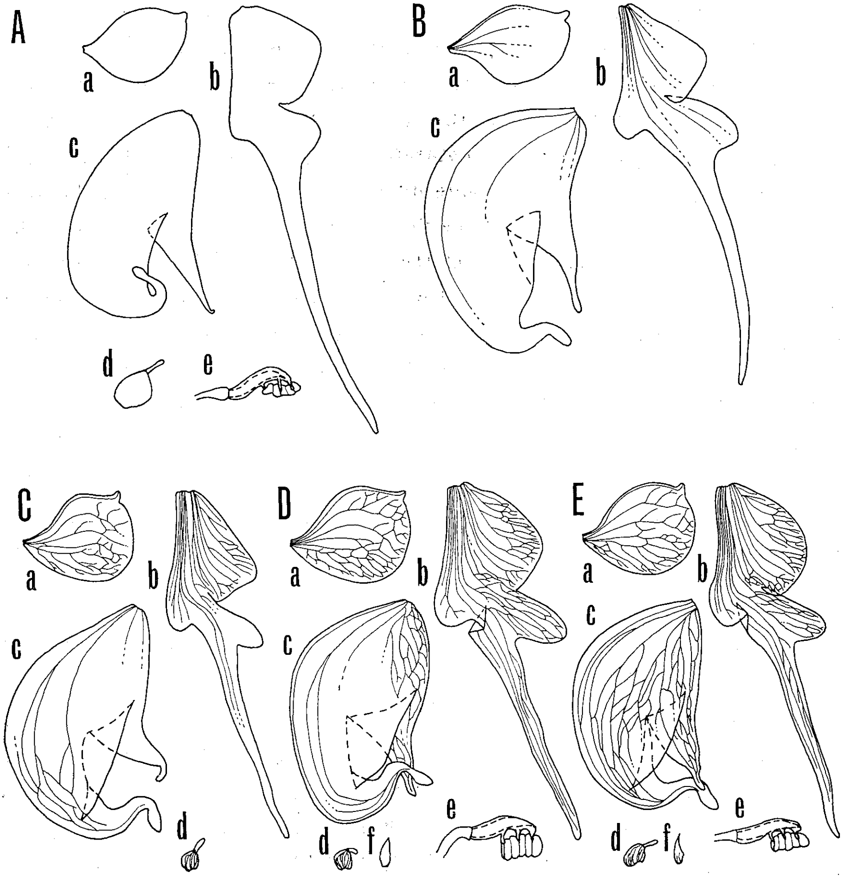


Fig. 1. Flowers of *I. Pradhani*. A: Isotype. B: Nepalese plant (O.W.S. & A. 8351176, TI). C–E: Nepalese plants from a single population (O.W.S. & A. 8331704-1—8331704-3, TI). a: Dorsal petal. b: Lateral united petals. c: Lower sepal. d: Lateral sepal. e: Stamens and pistil. f: Inner lateral sepal. All ×1.5.

the Nepalese population. The appendage of the lower sepal (Fig. 1Cc) in the Nepalese population is not so long and is similar to that of *I. bicornuta* (Fig. 2Ac-Cc). This appendage in another population (Fig. 1Bc) is also not so long. It is difficult to distingush *I. Pradhani* from *I. bicornuta* only by the difference of length of this appendage. The shape of dorsal petal is cucullate and has no

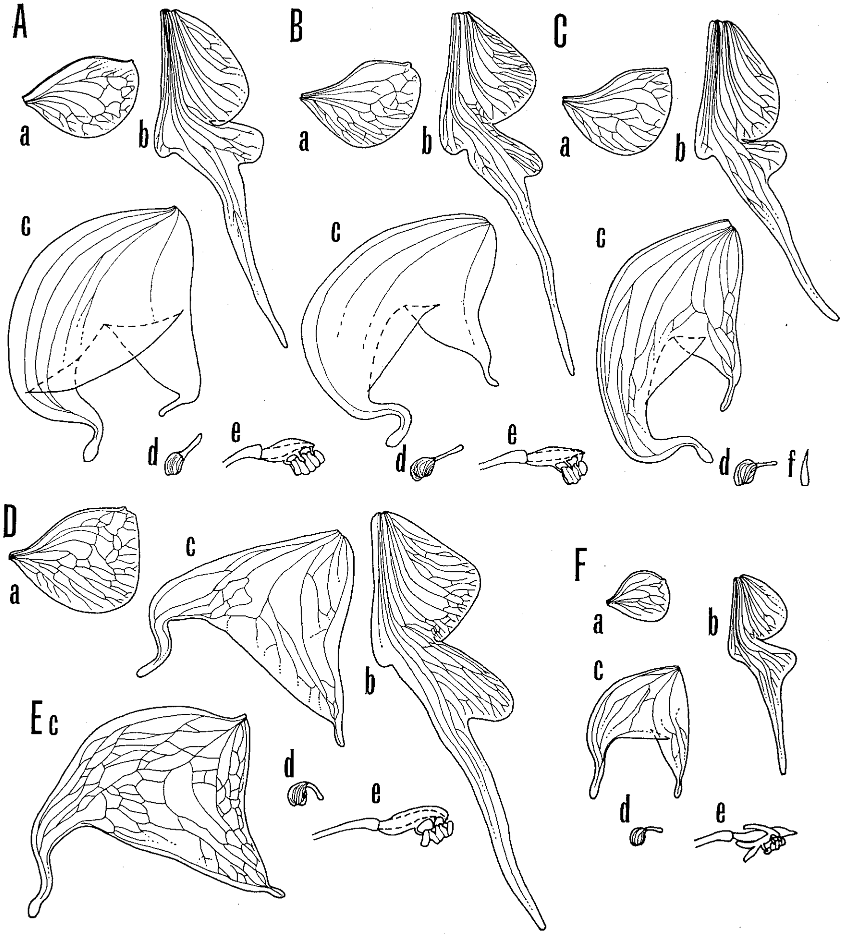
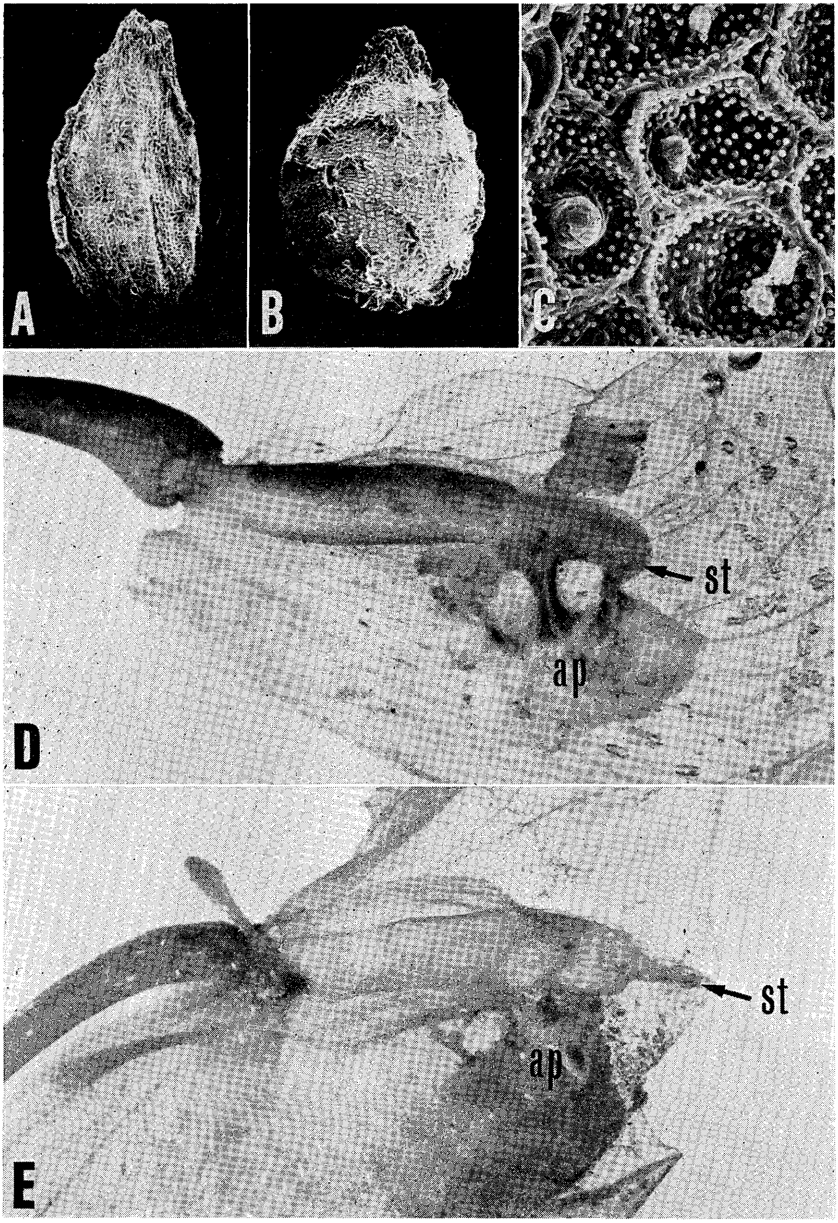


Fig. 2. Flowers of *I. bicornuta* (A-C), *I. Harai* (D & E) and *I. Harai* var. *micrantha* (F). A: O.W.S.K.R. & W. 8531297. B: O.W.S.K.R. & W. 8531298-1. C: O.W.S.K.R. & W. 8531298-2 D: Holotype. E: O.W.S.K.R. & W. 8530740. F: Isotype. All ×1.5.


A
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difference from that of *I. bicornuta.* The shape of the lateral united petals (Fig. 1Ab–Eb) is almost the same as that of *I. bicornuta* (Fig. 2Ab–Cb). The shape and size of seeds and the structure of testa of *I. Pradhani* (Fig. 3A & C) resemble those of *I. bicornuta* (Fig. 3B). Moreover, as shown in the Nepalese populations, *I. Pradhani* often has wingless stems.

I. Pradhani, however, has yellow flowers with red-purplish or brownish dots on petals and differs from *I. bicornuta,* which has pale red-purple flowers with dark red-purple dots on petals. Those two species were not found growing in the same population. So that, nevertheless it is difficult to distinguish *I. Pradhani* from *I. bicornuta* except for the colour of the flowers, I refrain from reducing *I. Pradhani* into the synonymy of *I. bicornuta* or marking a new combination.

On the other hand, Professor Hara (1975) described a variety of *I. bicornuta,* var. *micrantha,* based on his own collection from central Nepal. This variety is characterized by the small flower, the lower sepal of which is 10–12 mm long. The flower of the isotype specimen of this variety is dissected and examined. The shape of the lower sepal is found to be bucciniform with abruptly narrowed short spur (Fig. 2Fc) and quite different from that of var. *bicornuta* (Fig. 2Ac–Cc). The ovary is large and elongated, and is breaking down the column of stamens (Figs. 2Fe and 3E). It is noticeable that the pollen grains are shed directly on the stigma before the flower opens.

In 1985 Dr. Ohba collected an *Impatiens* in eastern Nepal. The size of the flower of this *Impatiens* is similar to that of *I. bicornuta* var. *bicornuta* but the lower sepal of the flower is bucciniform with abruptly narrowed short spur (Fig. 2Dc & Ec), resembling that of var. *micrantha.* It is remarkable that in this *Impatiens,* unlike var. *micrantha,* the flower is primarily outcrossing and the pollens are shed after the flower opens as like as *I. bicornuta,* s. str. (Fig. 3D). The shape of the lower sepal of this Nepalese *Impatiens* seems to be stable.

In conclusion, on the basis of the shape of the flowers var. *micrantha* and the Nepalese *Impatiens* should be separated from *I. bicornuta* as a distinct species, and the Nepalese *Impatiens* should be distinguished from var. *micrantha* as a

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Fig. 3. A & C: Seed of *I. Pradhani* (O.W.S. & A. 8320598); A×18, C×680. B: Seed of *I. bicornuta* (O.W.S.K.R. & W. 8531298-2); ×18. D & E: Stamens and pistil at flowering; ×10. D: *I. bicornuta* (O.W.S.K.R. & W. 8531298-2). E: *I. Harai* var. *micrantha* (Isotype). st: Stigma. ap: Anthers and shed pollens.

variety of the same species. I like to name this new species as *I. Harai*, because the name *micrantha* has the preceding name in specific category.

Systematic treatment:

Impatiens bicornuta Wall. in Roxb., Flora Indica **2**: 460 (1824); Hara in Hara & Williams, Enum. Flow. Pl. Nspal **2**: 78 (1979).

Distr. Himalaya (Garhwal to Assam).

Specimens collected in 1983 and 1985. C Nepal. Dhaulagiri Zone, Parbat Distr., Ghandruk (1950 m)-Ghandruk Deorali (2530 m) (Ohba, Kanai, Wakabayashi, Suzuki & Akiyama 8310204 & 8350197, TI); Marsyandi Khola, Chame (2630 m)-Qupar (2530 m)-Thangjo (2580 m)-Dhanagyang (2200 m) (O.K.W.S. & A. 8311069, TI); Khare Khora, Phedi Kharka (2100 m)-Koplang (2100 m)-Khanigaon (1700 m) (O.W.S. & A. 8332089 & 8320726, TI). E Nepal. Janakpur Zone, Ramechhap Distr., Bhandar (2300 m)-Deorali (2700 m)-Khasrubus (2400 m)-Shivalaya (1800 m) (Ohba, Kikuchi, Wakabayashi, Suzuki, Kurosaki, Rajbhandari & Wu 8571363, TI); Sagarmata Zone, Solukhumbu Distr., Sarkari Pati (3350 m)-Ringmo (2700 m)-Phera (2500 m)-Beni (2350 m) (O.W.S.K.R. & W. 8531273, TI); Beni (2350 m)-Lekhani (2700 m)-Tambakhani (2800 m)-Loading Khola (2350 m)-Loding (2600 m) (O.W.S.K.R. & W. 8531297, 8531298-1, 8531298-2 & 8572281, TI).

I. Pradhani Hara in Journ. Jap. Bot. **40**: 99 (1965).

Distr. E Himalaya (Nepal & Sikkim).

Speciemns examined. Sikkim. Prope Lagyap. alt. 2000-2300 m (Pradhan & Hara 6306729, TI—Holotype and Isotypes). C Nepal. Rolwaling Khola, Kyalche (2700 m)-Dongang (2650 m)-Thandingma (3200 m) (O.W.S. & A. 8331704-1-8331704-3, TI); Rolwaling Khola, Simigaon (1950 m)-Sekpa (2300 m)-Kyalche (2700 m) (O.W.S. & A. 8351176 & 8320598, TI); Marsyandi Khola, Chame (2630 m)-Qupar (2530 m)-Thangjo (2530 m)-Dhanagyang (2200 m) (O.K.W.S. & A. 8320520, TI).

I. Harai H. Ohba et S. Akiyama, sp. nov.

Herba annua, erecta ad 50-70 cm alta; caules validi crassiusculique glaberi, sed glandulas breves prope axem caulis superioris orientes. Folia alterna, versus apicem caulis aggregata, (petiolo glabero 5-7 cm longo incluso) 15-25 cm longa; lamina 10-20 cm longa 4-6 cm lata, elliptica apice acuta basi attenuata, utrimque insigniter pubescenti, margine crenata, nervis lateralibus 8-10-jugis. Inflorescentiae axillares aggregeatae versus apicem caulis, interrupto-racemosae, floribus 3- vel 4-subverticillatis, in unaquaeque floribus 15 vel multo compositae.

Flores dulute purpurei, ab apice infimi sepali ad apicem dorsalis petali ca. 2.7 cm longi. Pedunculus inclusa rhachi 8–17 cm longus, erectus, glaber. Bractea ad basin pedicelli proveniens, persistens, (apicis projectura aristata glandulifera 2–3 mm longa inclusa) ca. 5 mm longa, late ovata. Pedicellus subradiatus, 2–3 cm longus, glaber. Sepala lateralia numero 2, (mucrone apicis prominento glandulifero ca. 2 mm longo incluso) ca. 4 mm longa, late ovata, glabra. Sepalum infimum (Fig. 2Dc) bucciniforme, 20–24 mm longum, apice sufflatum, dilute purpureum, sed luteum punctis fuscis prope calcar notatum, calcari brevi ca. 6 mm longo abrupte incurvato. Petalum dorsale (Fig. 2Da) cucullatum, pallide purpureum, 9–11 mm longum, apice cristatum mucrone brevissimis terminatum. Unitis petalis lateralibus (Fig. 2Db) pallide purpureis sed area centrali lutescentibus rubropunctatisque, ca. 39 mm longis; petalo supremo 11×7 mm magno ovato; eo infimo 26 mm longo 6 mm lato, bilobato, ex lobo supremo oblongo et infimo 19×2 mm magno ligulato constanti. Stamina (Fig. 2De) connata, ca. 6 mm longa, ovarium stigmaque cingentia, antheris dorsifixis sine appendice. Gynoecium ad anthesin ca. 6 mm longum, ovario glabro. Fructus ca. 2.5 cm longus, linearis, glaber. Semina ovoidea, ca. 2×1.2 mm magma; testa toto granulata areolataque, mature papilla brevi ab centro areolae exoriente.

Typus. E Nepal. Janakpur Zone, Ramechhap Distp., Neju (3651 m)-Choarma (2760 m) (Ohba, Wakabayashi, Suzuki, Kurosaki, Rajbhandari & Wu 8530680, TI).

Other specimens examined. E Nepal. Janakpur Zone, Ramechhap Distr., Choarma (2760 m)-Kyama (2600 m) (O. W. S. K. R. & W. 8530740, TI).

Distr. E Nepal.

This species grows sporadically on the moss-covered light floor of some well developed *Abies spectabilis*-forest.

var. **micrantha** (Hara) H. Ohba et S. Akiyama, comb. nov.

I. bicornuta Wall. var. *micrantha* Hara in Ohashi, Fl. E. Himal. 3rd rep., 78 (1975); in Hara & Williams, Enum. Flow. Pl. Nepal 2: 78 (1979).

Smaller plant. Leaves 13–18 cm long including the petiole. Flowers small, ca. 15 mm long, self-pollinated before perianths open (Fig. 2F).

Specimens examined. C Nepal. Dunche (2000 m)-Trisuli Khola (1900 m)-Singum Gompa (3200 m) (Kannai, Hara & Ohba 723214, TI—Holotype and Isotypes of *I. bicornuta* Wall. var. *micrantha* Hara). E Nepal. Honkon (2400 m)-a bridge (2000 m)-Chantang (2250 m) (Ohashi, Kanai, Ohba & Tateishi 774937, TI).

Distr. E Nepal and C Nepal.

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ツリフネソウ属はヒマラヤで多様化した属の1つである。1983年および85年のネパールにおける東京大学の調査で採集された標本を調べたところ，今までシッキムからの報告しかなかった *Impatiens Pradhani* Hara がネパールにも分布しており，しかも栄養器官および花部の形態では *I. bicornuta* Wall. と区別できないほど近似していることがわかった。しかし，*I. Pardhani* の花は黄色で花弁に赤紫色または赤茶色の斑点があるのに対し，*I. bicornuta* の花は淡紅紫色で濃紅紫色の斑点があり，しかも，この両種は同所的に生育していることはない点が注目される。また，ネパールから *I. bicornuta* によく似た新植物が見いだされた。この植物は，下萼片（唇弁）の形が，*I. bicornuta* とは異なる。なお，*I. bicornuta* の変種として記載された var. *micrantha* Hara は，この植物と同じ形の下萼片を有していることが判明した。したがって，この植物と var. *micranth* を同種として，*I. bicornuta* とは別種とするのが適当と考えられたので，**I. Harai** として記載した。

○ミヤコグサ属の新外来品について（淺井康宏）　Yasuhiro Asai: *Lotus subbiflorus* Lag. newly naturalized to Japan

我国に帰化したミヤコグサ属 *Lotus* の植物については，既に大橋・立石両氏によって詳細に検討，報告（植研 **49**: 73, 1974）されている。ところで最近，この仲間の新しい侵入品が確認されたので記録しておきたい。その概形を記せば，次のようなもので